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15 (71) Applicant: Matsushita Electric Industry Co., Ltd.

1006, Oaza Kadoma, Kadoma-shi, Osaka-fu

(72) Inventors: NOMOTO Hiroshi, IKUNO Kunihiro

c/o Matsushita Electric Industry Co., Ltd.

1006, Oaza Kadoma, Kadoma-shi, Osaka-fu

20 (74) Agent: Patent Attorney, AWANO Shigetaka (other 1)

## 1. Title of the Invention

MANUFACTURING METHOD FOR LIQUID CRYSTAL PANEL

## 25 2. Claim

A manufacturing method for a liquid crystal panel, in which two electrode substrates are adhered to each other so that between the two substrates are a sealant mixed with a spacer material and a temporary fixing material for preventing shifting of the two substrates, and then while the parts of  
30 the two electrode substrates near the temporary fixing material are pressurized, the temporary fixing material is cured to perform temporary fixing, characterized

in that a spacer material, which is smaller than the spacer material mixed with the sealant or becomes smaller when being pressurized and cured, is mixed in the temporary fixing material.

### 5 3. Detailed Description of the Invention

#### Industrial Field of Application

This invention relates to a manufacturing method for a liquid crystal panel and particularly to the spacer material mixed with a temporary fixing material used for temporarily fixing two electrode substrates.

#### 10 Prior Art

In order to temporarily fix two electrodes substrates, a method has been adopted heretofore in which into a temporary fixing material is mixed a spacer material having the same size as the spacer material mixed with the sealant, and while the parts of the electrode substrates near the temporary fixing material are pressurized, temporary fixing is performed.

#### Problems that the Invention is to Solve

In the case where into the temporary fixing material is mixed a spacer material having the same size as the spacer material mixed with the sealant, however, when the temporary fixing material is cured as pressure is put on the parts of the electrode substrates near the temporary fixing material, and then pressurization is removed, rebound force acts due to elasticity of the temporary fixing material, resulting in that the size of the temporary fixing material becomes larger than the size of the spacer material in which sealant is mixed.

Consequently, when the whole of both electrode substrates is pressurized and the sealant is cured in such a state, the size of the clearance gap between both electrode substrates near the temporary fixing material is still larger than the size of the spacer material mixed with the sealant, which causes the problem of gap failure.

It is an object of the invention to provide a manufacturing method for a liquid crystal panel which solves the above problem.

#### Means for Solving the Problems

In order to achieve the object, the invention is characterized in that a spacer material which is smaller than the size of the spacer material mixed with the sealant, or which becomes smaller when being pressurized and cured, is mixed with a temporary fixing material.

## 5           Operation

According to the invention, in the above constitution, after the temporary fixing material is cured by putting pressure on the parts of the both electrode substrates near the temporary fixing material, even if rebound force is generated by elasticity or the like of the temporary fixing material due to  
10   unloading of pressure, the size of the temporary fixing material does not become larger than the spacer material mixed with the sealant because spacer material which is smaller in size than the spacer material mixed with the sealant or which becomes smaller, is previously mixed with the temporary fixing material.

## 15           Embodiment

A manufacturing method for a liquid crystal panel in one embodiment of the invention will now be described according to the attached drawings. Figs. 1 to 3 are diagrams showing the process and its operation in the manufacturing method.

20           In Fig. 1, 1 is an electrode substrate, and 2 is the counterpart substrate. Two substrates 1, 2 are disposed opposite to each other so that between them are a spacer material 3 of a picture element part, a sealant 4, a spacer material 5 mixed with the sealant 4, a temporary fixing material 6 and a spacer material 7 mixed with the temporary fixing material 6. In the drawing, the electrode  
25   substrate 1 and the counterpart substrate 2 are superposed one over the other, and then load P1 is applied to the part of the counterpart substrate 2 near the temporary fixing material 6. When the load P1 is applied, the temporary fixing material 6 is compressed so that the spacer material 7 mixed with the temporary fixing material 6 engages with the temporary fixing material 6.  
30   Although the picture element part to which load is not applied is engaged by the sealant 5, it can't be sufficiently compressed.

In such a state, the temporary fixing material 6 is cured, and when the load P1 is eliminated as shown in Fig. 2, the rebound force due to elasticity of the temporary fixing material 6 acts on the counterpart substrate 2, so that the above part of the counterpart substrate 2 is raised. However, spacer material 7 which was smaller than the size of the spacer material 5 mixed with the sealant 4 or which has become smaller was previously mixed with the temporary fixing material 6, so a clearance gap equal to the size of the spacer material 5 mixed with the sealant 4 is maintained between the part of the counterpart substrate 2 which has expanded in size and the electrode substrate 1.

Subsequently, when load P2 is applied to the picture element part to cure the sealant 4 as shown in Fig. 3, the sealant 4 is compressed to engage the spacer material 5 mixed with sealant 4. As a result, the height of the temporary fixing material 6 is the same as the size of the gap of the picture element part or a little smaller than it.

Thus, the gap failure caused by the temporary fixing material 6 as in the prior art can be prevented.

#### Advantage of the Invention

According to the invention, the parts of the both electrode substrates near the temporary fixing material are pressurized to cure the temporary fixing material, and even if rebound action is caused after pressurization is eliminated, the size of the temporary fixing material is held smaller than the size of the spacer mixed with the sealant, so that gap failure caused in temporary fixing heretofore can be eliminated.

#### 4. Brief Description of the Drawings

Fig. 1 is a partial section showing the condition where pressure is put on a counterpart substrate in the vicinity of a temporary fixing material in a manufacturing method for a liquid crystal display panel according to one embodiment of the invention;

Fig. 2 is a partial section showing the condition where the pressure is removed; and

Fig. 3 is a partial section showing the condition where pressure is put on the part of the counterpart substrate corresponding to a picture element part to form a clearance gap.

1: electrode substrate 2: counterpart substrate 4: sealant 5: spacer  
5 material 6: temporary fixing material 7: spacer material